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Pham H. Tiep* (tiep@math.arizona.edu), Department of Mathematics, University of Arizona, 617 N. Santa Rita Ave., P.O. Box 210089, Tucson, AZ 85721-0089. *The non-commutative Waring problem*. Preliminary report.

The classical Waring problem deals with expressing every natural number as a sum of $g(k)$ k th powers. Recently there has been considerable interest in non-commutative variants of this problem for non-abelian groups, and simple groups in particular. Here the k th power word can be replaced by an arbitrary group word $w \neq 1$, and the goal is to express group elements as short products of values of w . It was shown by Larsen, Shalev, and the speaker in 2011 that, for (non-abelian) finite simple groups of sufficiently high order, a product of length two suffices to express all elements. In this talk we will report on more recent results on the non-commutative Waring problem, obtained in joint works with R. M. Guralnick, M. Larsen, M. Liebeck, E. O'Brien, and A. Shalev. (Received October 28, 2014)